

Appln No. 09/403,472

Amdt date March 24, 2004

Reply to Office action of November 24, 2003

REMARKS/ARGUMENTS

The applicants have carefully studied the outstanding final Office Action. The applicants believe the present amendment to be fully responsive to all points of final rejection raised by the Examiner, and to place the application in condition for allowance. The applicants respectfully submit that the amendments made herein are for the purpose of clarifying the previously recited limitations, or to add additional qualifications to the limitations of the claim currently on file. Favorable reconsideration and allowance of the application are respectfully requested.

Request for Acknowledgment of Information Disclosure Statement

Applicants submitted an Information Disclosure Statement to the U.S. Patent Office on May 31, 2000. To date, applicants have not received confirmation that the Examiner has considered this Information Disclosure Statement. For the Examiner's convenience, copies of this Information Disclosure Statement and the accompanying FORM PTO-1449 are attached as an Appendix to this Amendment. Applicants request that initialed copies of the FORM PTO-1449 be entered in the application file and returned to applicants with the next communication from the Office in accordance with MPEP § 609.

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Claim Amendments

Claim 1 has been amended by the addition of limitations which define more of the structural details of the discontinuous phase element and a relationship of these structural details to a propagation of at least one desired mode and at least one undesired mode. Support for the recitation of the planar regions of the element may be found, for example, in the specification in Fig. 4, and its associated description on page 13. Support for the recitations "defining a boundary . . .", "to separate regions of field distributions . . ." and "such that said separate regions . . ." may be found, for example, in the specification on page 6, last paragraph, onto the top of page 7, and on page 12, last paragraph.

Furthermore, the limitation that the "at least one discontinuous phase element is disposed such that said at least one sharp discontinuity falls in a region of low intensity of a desired mode propagating in said resonator", as recited in cancelled claim 16 and introduced into claim 1 in the previously filed amendment, has been removed from currently amended claim 1, and reinstated as originally filed as new dependent claim 30.

Claim Rejections - 35 U.S.C. § 112

Claims 1-15,17-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 20, the Examiner states that it is

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not clear within the claim language how the structural alignment of the discontinuous phase element with the undesired and desired mode is obtained, since the claim only recites disposing a discontinuous phase element within reflector elements.

The applicants respectfully submit that amended claim 1 now not only recites specifically claimed structural details of the discontinuous phase element, but also how the alignment of those specifically claimed structural details of the discontinuous phase element is such as to generate the interaction with the desired and undesired modes. It is well-known in the art that such desired and undesired modes may exist in a cavity as a result of a particular cavity geometry, including the end mirrors, the gain medium, any apertures within the cavity, etc. Amended claim 1 now recites specifically that the "at least one discontinuous phase element" is aligned such that the specific claimed structural details "introduce a discontinuous phase change to separate regions of field distributions in at least one desired mode propagating in said resonator."

The applicants therefore respectfully request withdrawal of the Examiner's grounds for rejection of claim 1 under 35 U.S.C. 112, second paragraph. Similar arguments are also submitted with respect to amended claim 20, and the applicants also respectfully request withdrawal of the Examiner's rejection of claim 20 under 35 U.S.C. 112, second paragraph.

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Claim rejections - 35 USC § 102

Claims 1,2,4,5,7,11,12,14,15,17-22,24-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Leger (U.S. Patent No. 5,745,511). The Examiner states that "Figure 4A illustrates a static discontinuous phase plate (129) placed between reflectors (124,121) within a resonator of a laser system to provide phase adjustment and modal discrimination. As disclosed in column 7 lines 39-50, custom phase adjustment element 129 provides enhanced modal discrimination by introducing a phase shift, which varies in a pseudo-random manner which implies discontinuity as shown in the figure with the sharp peaks and discontinuous shape."

In contrast to the methods of the Leger patent, the present claimed invention involves the use of a discontinuous phase element, having a specific structure to its claimed discontinuity, and the manner in which the elements of this structure "introduce a discontinuous phase change to separate regions of field distributions in at least one desired mode . . . ", etc., is clearly recited. Nowhere, to the best of the applicants' understanding, is there mentioned or suggested in Leger, the elements as recited in the parts emphasized below by bold type in amended claim 1 of the present invention:

"An optical resonator comprising reflector elements and at least one static discontinuous phase element disposed between said reflector elements, said at least one discontinuous phase element having **planar regions** and **at least one sharp discontinuity** defining a boundary between said planar

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regions, said at least one discontinuous phase element being aligned such that said planar regions introduce a discontinuous phase change to separate regions of field distributions in at least one desired mode propagating in said resonator, and such that said separate regions of said field distributions of said at least one desired mode, after traversing said element, are generally in phase, and said at least one sharp discontinuity being operative to produce a change in the phase of at least one undesired mode of said resonator, and being disposed at a location corresponding to an area of significant intensity of said at least one undesired mode, whereby the divergence of said at least one undesired mode is greater than that of said at least one desired mode and propagation of said at least one undesired mode is suppressed."

The applicants have amended Claim 20 in a similar manner to the amendments made to claim 1.

It is therefore respectfully submitted that independent claims 1 and 20 are not anticipated by Leger, and are thus allowable. Claims 2, 4, 5, 7, 11, 12, 14-19, 21-22, and 24-28 are dependent from either of claims 1 or claim 20, and recite further patentable subject matter. Since claims 1 and 20 are now deemed to be allowable, claims 2, 4, 5, 7, 11, 12, 14-19, 21-22, and 24-28 are also deemed to be allowable.

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Claim rejections - 35 USC § 103

Claims 3, 6, 8-10, 13, 23, 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Leger (U.S. Patent No. 5,745,511), Fink (U.S. patent No. 5,283,796) and Harris (U.S. patent No. 3,605,039).

Claims 3, 6, 8-10 and 13 are dependent from amended claim 1, and recite further patentable subject matter. Claim 23 is dependent from claim 20, and recites further patentable subject matter. Since amended claims 1 and 20 are now deemed to be allowable, claims 3, 6, 8-10, 13 and 23 are also deemed to be allowable. Claim 29 has been cancelled without prejudice, thus rendering moot the Examiner's rejection thereof.

The applicants therefore respectfully submit that claims 3, 6, 8-10, 13 and 23 are believed to be free of the grounds of rejection under 35 U.S.C. 103(a). Withdrawal of such rejection is respectfully requested.

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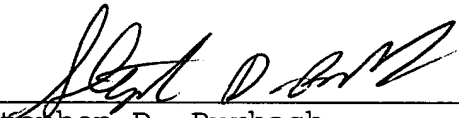
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Conclusion

For all of the reasons set forth above, applicants respectfully submit that all of the claims, amended as applicable, are believed to define patentable subject matter over the prior art, and are considered to be in condition for allowance. Entry of this amendment, and reconsideration and prompt allowance of this application are therefore respectfully requested.

Respectfully submitted,
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APPENDIX